Widespread Economic Impact Analysis for Montana Facilities: City of Grass Range

Draft

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1. Introduction

According to EPA's Interim Economic Guidance for Water Quality Standards (U.S. EPA, 1995), if financial tests demonstrate that pollution control expenditures would have substantial adverse economic impacts, the next step is to determine whether there would also be widespread economic impacts to the community or surrounding area. U.S. EPA (1995) does not provide specific standardized tests to determine whether impacts would be widespread; instead, it provides guidance on how to evaluate the magnitude of expected changes to indicators such as increased employment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increased sewer fees to remaining private entities. At a minimum, the analysis must define the affected community (the geographic area where project costs pass through to the local economy), consider the baseline economic health of the community, and evaluate how the proposed project will affect the socio-economic well-being of the community.

The Montana Department of Environmental Quality (Montana DEQ) has developed a set of descriptive and criteria questions designed to evaluate the potential for widespread impacts.[1] Appendix A provides the full list of questions as well as guidance provided by Montana DEQ in how to collect and interpret appropriate data.

In a previous analysis,[2] Abt Associates determined that the Town of Grass Range is likely to experience substantial economic impacts as a result of meeting applicable numeric nutrient criteria. Based on Montana DEQ's widespread test, this document provides the results of a preliminary analysis to determine whether the impacts would also be widespread. Each subsection corresponds to a question in Montana DEQ's test.

[1] PublicEntity_Worksheet_EPACostmodel_2016.
[2] Analysis dated June 30, 2016.

2. Descriptive Questions

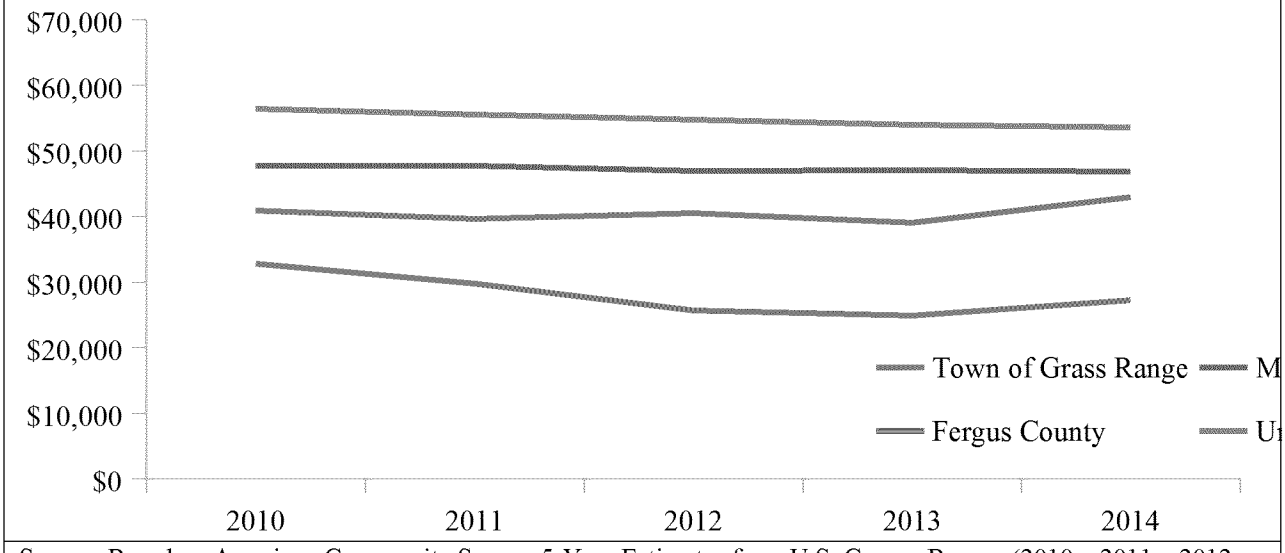
2.1 Definition of Geographic Area

The Town of Grass Range Wastewater Treatment Plan (WWTP) serves a fewer than 100 households in the rural Town of Grass Range (Montana DEQ, 2015) in Fergus County. For this analysis, EPA assumed that the affected community is the Town.

2.2 Description of General Economic Trends

According to data from the U.S. Census Bureau's American Community Survey (ACS),[3] the Town of Grass Range has lower median household income (MHI) than the state, at $27,188 compared with $46,766 during the same time period (U.S. Census Bureau, 2014b). Exhibit 1 shows the MHI trends for the town and the state compared with the United States between 2010 and 2014, with all dollar values adjusted to 2015$ using the Consumer Price Index (CPI; United States Bureau of Labor Statistics (U.S. BLS), 2016a). Over that time period, MHI in Grass Range decreased by 17%, which represents a steeper decline than experienced by the state (2%) or the nation (5%).

Exhibit 1. Median Household Income, 2010-2014

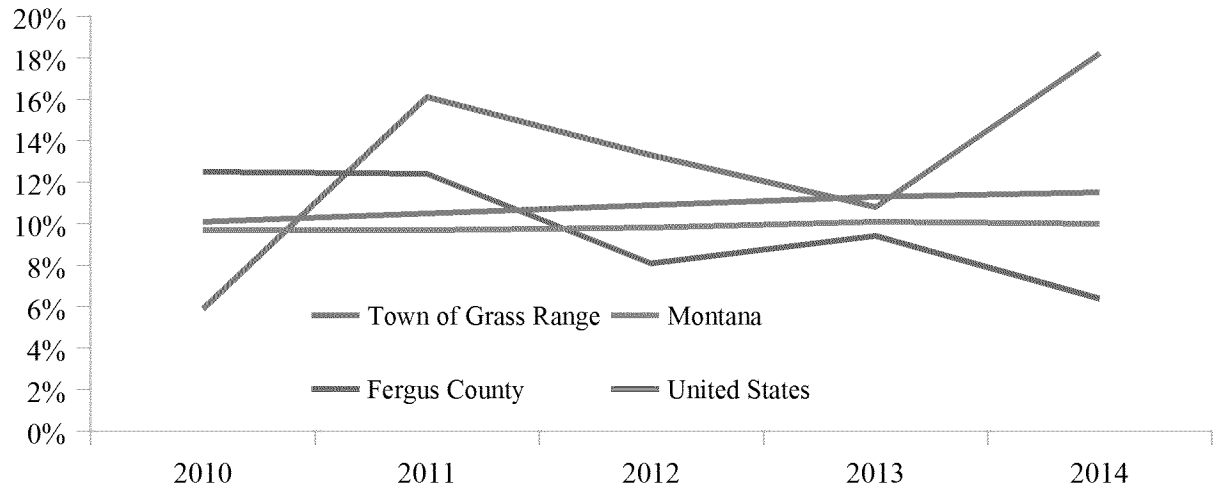


Source: Based on American Community Survey 5-Year Estimates from U.S. Census Bureau (2010a; 2011a; 2012a; 2013a; 2014b); all values restated to 2015$ using the Consumer Price Index.

The poverty rate in Grass Range (18.2%) is higher than the United States (11.5%), Montana (10.0%), and Fergus County (6.8%). ACS data show more variation in the town's poverty rate relative to the national and state trends during that time, with a steep increase between the 2013 and 2014 data releases. In contrast, the county poverty rate has decreased over the 2010 to 2014 period, falling below the national and state rates. Exhibit 2 shows these trends.

[3] For this analysis, all data from ACS represent 5-year estimates, which are available for all places and represent the most precise data available. These data are interpreted as being representative of 60 months of collected data; for example, 2014 data represents the data from January 1, 2010 and December 31, 2014. For more information, see U.S. Census Bureau (2016).

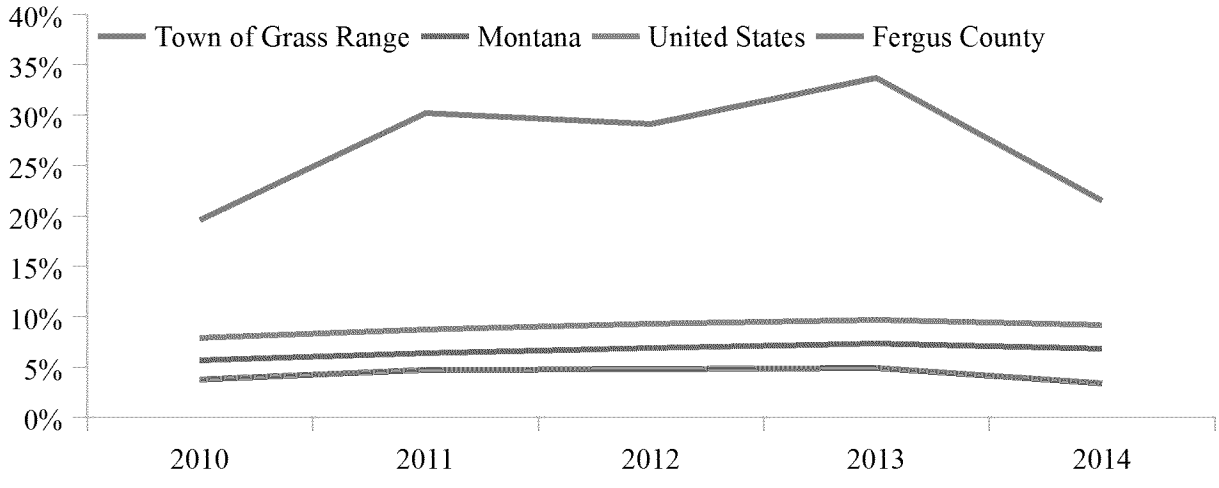
Exhibit 2. Percent of All Families Under the Poverty Threshold, 2010-2014



Source: Based on American Community Survey 5-Year Estimates from U.S. Census Bureau (2010a; 2011a; 2012a; 2013a; 2014b)

The unemployment rate in Fergus County was 3.7% in June 2016 (U.S. BLS, 2016b), which is lower than the state rate of 4.2% (U.S. BLS, 2016c) and the national rate of 4.9% (U.S. BLS, 2016d). However, note that BLS data on unemployment is not available at the community level, but rather at the county level. The unemployment rate in Fergus County is not likely to be representative of more local conditions in Grass Range. ACS data shows that the long-range trend is a significantly higher unemployment rate in Grass Range compared with county, state, and national rates (see Exhibit 3). The most recent ACS data indicates a Grass Range unemployment rate of 21.5%[4] compared with 3.4% in Fergus County (U.S. Census Bureau, 2014b). The town also has more variability in the rate, reaching as high as 33.7% in the 2013 data release.

Exhibit 3. Percent of Civilian Labor Unemployed, 2010-2014



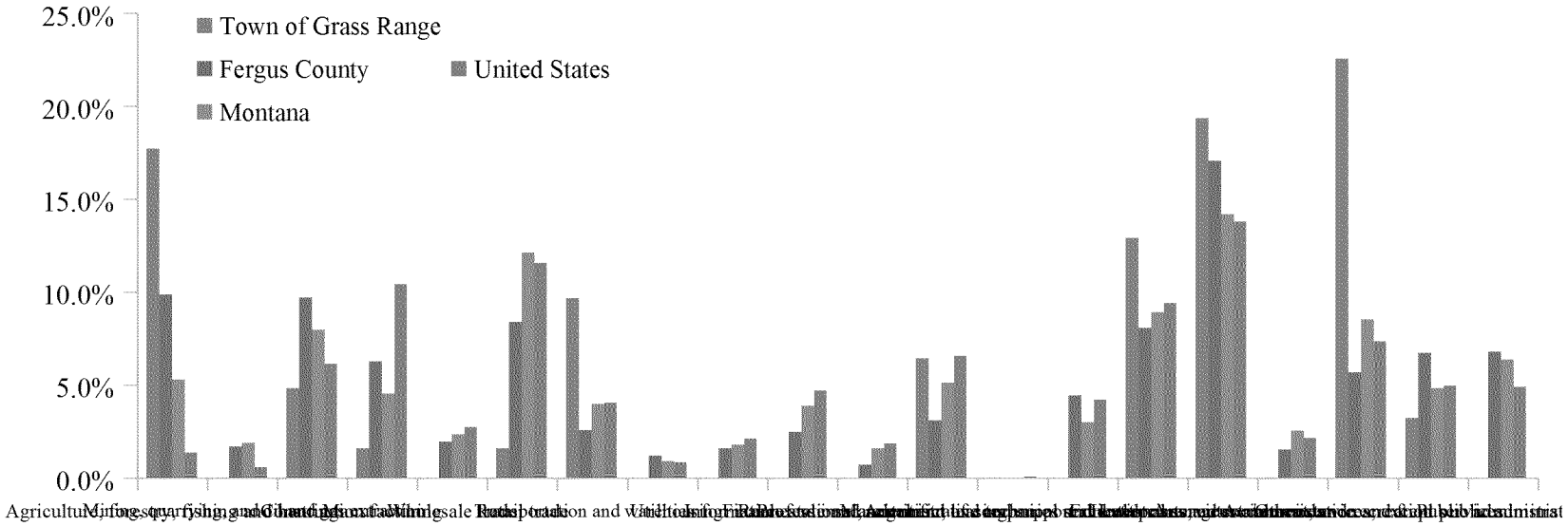
[4] Given the small population of Grass Range, this unemployment rate is based on a small sample size of only 79 individuals in the workforce. As such, it may not accurately represent employment rates in the local population. U.S. Census Bureau (2014b) reports a margin of error of +/-20.4% for the percent unemployed data for Grass Range.

Source: Based on American Community Survey 5-Year Estimates from U.S. Census Bureau (2010a; 2011a; 2012a; 2013a; 2014b)

2.3 Description of Industry Status and Trends

The Census Bureau's ACS provides some information about the industries providing employment in Grass Range, as well as at the county, state, and national levels, which is summarized in Exhibit 4. As shown in the exhibit, the town has a higher share of employment in agriculture, forestry, fishing, and hunting (17.7%), accommodation/food services (22.6%), transportation/warehousing (9.7%), educational services (12.9%), and health care/social services (19.4%) relative to county, state, and national levels. Together, the accommodation/food services, agriculture, forestry, fishing, and hunting, and health care/social assistance industries make up approximately 60% of employment.

Exhibit 4. Employment by Industry

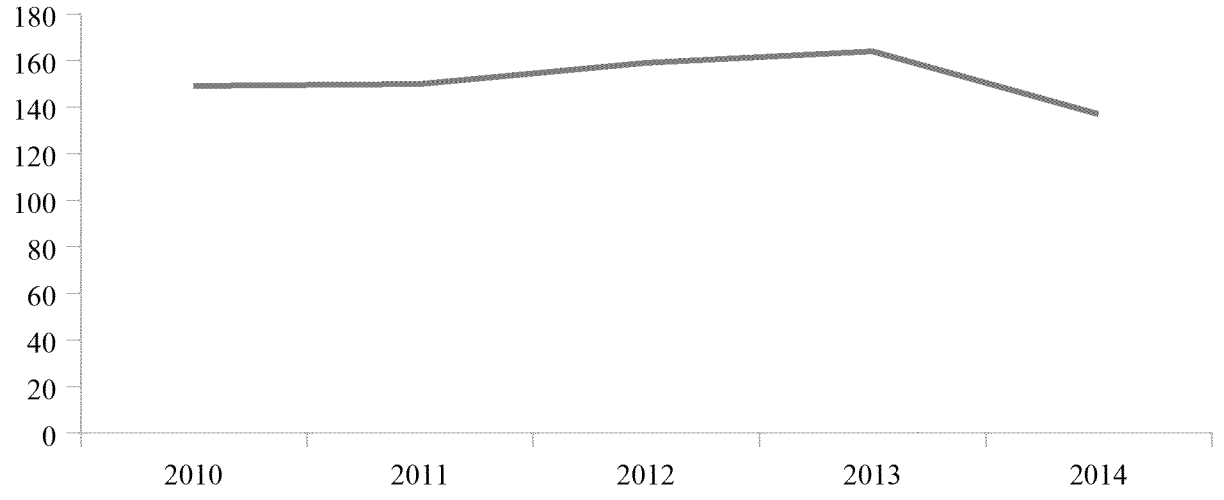


Source: Based on American Community Survey 5-Year Estimates from U.S. Census Bureau (2014c)

2.4 Description of Population Trend

According to 2014 ACS data (U.S. Census Bureau, 2014a), the Town has a population of 137, which reflects a decrease over the prior 5 years. Exhibit 5 shows the ACS population trend between the 2010 and 2014 data releases. The population increased between the 2010 and 2013 periods, then sharply declined by 16% by the 2014 release.

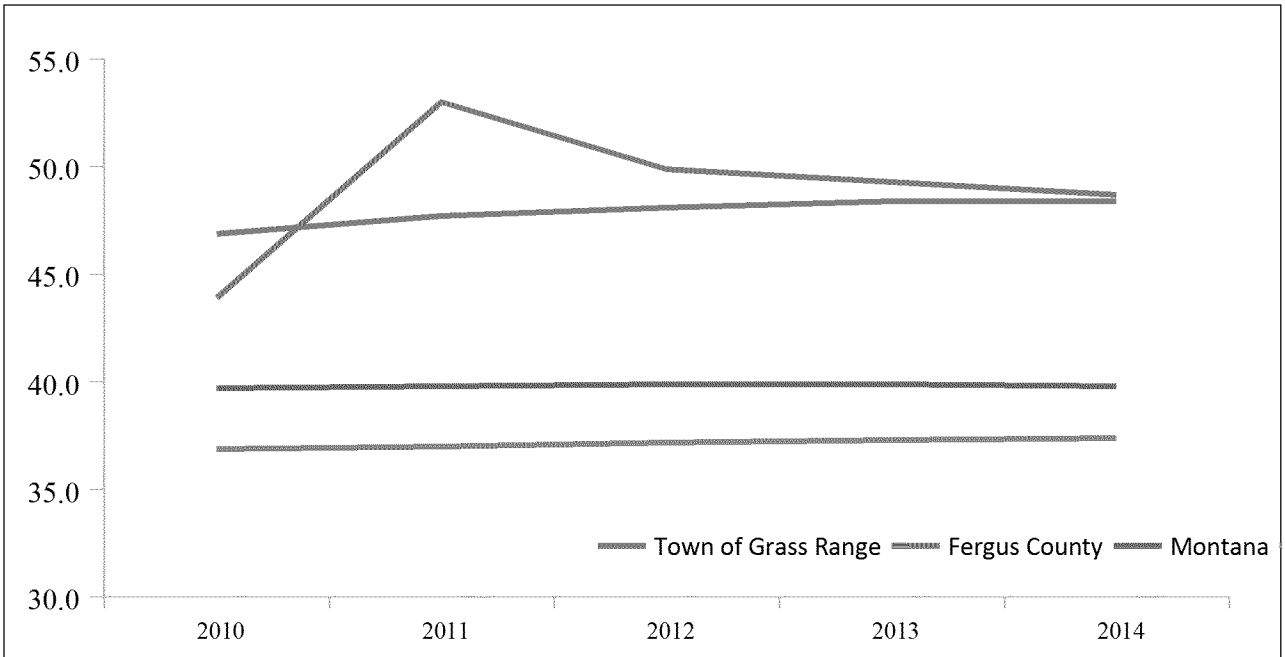
Exhibit 5: Population of the Town of Grass Range, 2010-2014



Source: Based on American Community Survey 5-Year Estimates from U.S. Census Bureau (2010b; 2011b; 2012b; 2013b; 2014a)

The median age in Grass Range has increased over the same period and is higher than the state and national average. Exhibit 6 shows the median age in the town, county, state, and nation over the 2010 through 2014 ACS data releases. In the 2014 data release, the median age in Grass Range was 48.7 compared with 48.4 in the county, 39.8 in the state, and 37.4 in the nation. According to ACS, 10.5% of households in Grass Range have retirement income, compared with 17.9% at the state level and 17.8% nationally.

Exhibit 6. Median Age of Population 2010-2014



Source: Based on American Community Survey 5-Year Estimates from U.S. Census Bureau (2010b; 2011b; 2012b; 2013b; 2014a)

The 2014 ACS reports that about 10% of adult Grass Range residents have attained Bachelor's degrees or higher, compared with 29% at the state and national levels (see Exhibit 7). About 92% of Grass Range residents (25 years and over) have attained a high school diploma or higher, compared with 92% at the state level and 86% at the national level (U.S. Census Bureau, 2014d).

Exhibit 7: Educational Attainment

Education Level (population 25 years and over)	Town of Grass Range	Montana	United States
Less than 9th grade	2.2%	2.2%	5.8%
9th to 12th grade, no diploma	5.6%	5.3%	7.8%
High school graduate (includes equivalency)	47.8%	29.8%	28.0%
Some college, no degree	32.2%	25.3%	21.2%
Associate's degree	2.2%	8.3%	7.9%
Bachelor's degree	10.0%	19.8%	18.3%
Graduate or professional degree	0%	9.2%	11.0%

Source: Based on American Community Survey 5-Year Estimates from United States Census Bureau (2014d)

3. Criteria Questions

3.1 General Economic Impacts

According to the Grass Range Clerk/Treasurer (Mullins, 2015), the existing annual household costs for wastewater treatment are $144, and we previously estimated that the pollution control project would increase the costs by $781, for a total annual cost per-household of $925. This represents a monthly increase of approximately $65 per household. Total wastewater costs per household would represent 3.7% of MHI (see the substantial impacts analysis).

In the evaluation of substantial impacts, we conservatively (i.e., erring on the side of overstating household impacts) that households bear 100% of baseline costs and would bear the same portion of project costs, or $61,713. Because information about commercial and industrial contributors was not available, we assumed that such entities would not constitute a significant share of the sewer costs.[5] However, if commercial and industrial contributors bear a substantial share of project costs through increased fees, then the pollution control project may dis-incentivize commercial investments in the community.

The potential for the pollution control costs to impact development potential is described further under Criteria Question 7.

3.2 Employment Impacts

If businesses and industries relocate outside of Grass Range or investment opportunities decrease as a result of the increased wastewater fees (as discussed further under Criteria Question 7), employment may be adversely impacted.

Some industries may be more likely to factor increased fees into location decisions (such as manufacturing and transportation/warehousing) compared with businesses that rely more on specific locations for income (such as agriculture, tourism, and local public administration). As described in under Criteria Question 3, Grass Range's largest shares of employment are in accommodation/food services, agriculture, forestry, fishing, and hunting, and health care/social assistance.

3.3 Development Impacts

Baseline average household wastewater rates in Grass Range are $12 per month (Mullins, 2015), while the average monthly wastewater rate for communities with a population less than 500 is $25.53 (Rural Community Assistance Corporation, 2014). As such, the Town's current wastewater rate is lower compared with other communities in the same size range.

In the substantial impact analysis, we estimated that the monthly household cost would increase by about $65, which is more than five times the existing rate. As such, it is possible that the increased wastewater treatment costs may cause decline in local residential development relative to the baseline scenario (i.e., without the additional costs). Increased wastewater rates could also result in the relocation of local businesses and industries outside of the community and reduce the town's ability to attract new

[5] Based on an online review of available information about local businesses, there appear to be a small number of entities including a post office, general stores, mechanics, and churches. The largest non-residential entity is likely the Grass Range School, which is likely to pass any sewerage expenditures to Grass Range residents.

investments. This impact is more likely if the town's wastewater rates become significantly higher than those in surrounding communities.

However, *existing* rates in surrounding communities may not be the appropriate basis for comparison to Grass Range's projected wastewater fees (including the pollution control project). Municipalities statewide and nationwide increasingly have to address nutrient impairments through improvements in treatment controls. Such improvements are expected to continue throughout Montana, increasing wastewater rates for many communities (see Fraser, 2016). For example, the Montana communities of Great Falls, Butte, Stevensville, Livingston, and Whitefish have all made recent upgrades to (or plan to upgrade) their wastewater collection and treatment systems, funded through increased fees (Rowell, 2016; Smith, 2016; Backus, 2016; City of Livingston, 2016; Flathead Beacon, 2016).

If surrounding communities' rates increase in a similar magnitude to those of Grass Range, the potential for adverse development impacts will be mitigated.

3.4 Disposable Income Impacts

Annual household wastewater expenses would increase from $144 to $925. As noted above under Criteria Question 5, this represents an increase of approximately $65 per month. This increase may depress local economic activity due to reduced purchasing power by affected residents. The magnitude of these impacts depends on the extent to which sewer bill increases result in reduced household expenditures on other locally produced goods and services.

The adverse impact to disposable income in the affected community will be exacerbated if outside contractors are used in the design and construction of the needed upgrades, since the additional wastewater revenues collected will be spent outside the community. On the other hand, if the expenditures stay in the community, adverse disposable income impacts could be offset by increased income for local workers and businesses benefitting from construction of new wastewater infrastructure.

3.5 Poverty Level Impacts

According to data from U.S. Census Bureau (2014b), an average of 18.2% of families in Grass Range had an income below the poverty level. This represents an increase from 10.8% since the 2013 data release and a higher rate than the county, state, and national levels for the same period (6.8%, 10.0% and 11.5%, respectively). If increased wastewater fees were to result in some local loss of employment and income, this may cause the poverty rate to increase in the community.

3.6 Multiplier Effects

To the extent that the capital investment and continuing operating and maintenance (O&M) expenditures become revenues to local businesses and employees, there is potential that the increase in user fees will actually result in a net economic benefit through a multiplier effect. Economic multipliers measure the overall effect on direct, indirect, and induced demand caused by a $1 increase in output for a particular industrial sector. The additional utility costs to install and operate new treatment systems that are spent in the local economy directly increase demand for local goods and services. To meet the increased demand, providers of those goods and services must also increase demand for their inputs, which is an indirect demand impact if they also purchase local inputs. In addition, the revenues and incomes received by local businesses and workers can increase the demand for other local goods and services, which is induced

demand because of higher business profits or worker income. The multiplier effect occurs when these direct, indirect, and induced expenditures remain in the local economy, and will be higher in the short-term during the construction phase.[6] On the other hand, if goods and services are purchased from outside the local economy, the money 'leaks' out and the multiplier effect diminishes.

Balanced against the beneficial multiplier benefit of the expenditures on treatment are the corresponding reductions in consumer spending caused by increased sewer fees. That is, the expectation is that an additional household consumer spending requirement for wastewater means reduced spending on everything else, assuming household income does not change. The portion of households' spending that occurs locally is a key driver of the magnitude of this effect in Grass Range. Generally speaking, consumer expenditures can have very high leakage rates because expenditures on consumer goods (e.g., groceries or hardware) and services (e.g., financial services) that are not locally produced tend to leave the local economy. If the leakage from the utility expenditures is less than the leakage from consumer expenditures, then theoretically there is a likely net economic benefit, depending on the exact leakage rates and multiplier values for each economic sector. Whether this is the case is unknown, however, because we do not have industrial multipliers specific to Grass Range. Net benefits measured for larger regions (e.g., at the state level) tend to show a net economic benefit. Krop et al. (2008) report the multiplier for the water and sewer industry was 1.799 (i.e., an extra $1 in water and sewer industry output results in a $1.79 increase in Montana-wide output), which may be higher than the multiplier on state-wide consumer expenditures. That value was based on 1997 industrial input-output relationships; current relationships likely differ, so the multiplier today will also differ. It is unlikely that Grass Range has a multiplier this high, especially if the capital goods and specialty services (e.g., engineering) come from outside the community. In fact, if a large proportion of capital or O&M expenditures leak from the local economy, the multiplier could be less than 1.0.

3.7 Net Debt Impacts

Additional pollution controls would significantly increase the town's annual wastewater treatment costs, from $11,376 currently to $73,089 (including annualized capital and recurring O&M costs).

As noted in the substantial impact analysis, the town does not currently have any long-term outstanding debt. However, If the Town is unable to finance the pollution control project via grants, it would need to take on debt. As described in the substantial impact analysis, we estimated that the capital costs (including land) of the project would be in the range of $630,000.

The impacts of taking on debt could be further exacerbated if higher sewer rates depress demand for properties in the community, lowering the market value of property, which could lead to higher property tax rates or reduced services that rely on local public funding.

3.8 Water Quality Impacts

The Grass Range WWTP discharges to the South Fork McDonald Creek, a perennial stream in the Box Elder watershed (Montana DEQ, 2011). Designated uses include bathing, swimming, and recreation; and growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl, and furbearers. The stream is considered "naturally marginal for drinking, culinary and food processing purposes,

[6] The multiplier effects will continue in the longer term at a decreased impact (compared with during construction), as the expenditures associated with operations and maintenance of the new treatment systems continue.

agricultural, and industrial water supplies." The creek is not currently listed as impaired by Montana, and continued protection of water quality would ensure that the waterbody retains appropriate uses.

3.9 Additional Impacts

None applicable.

4. Summary and Conclusions

The Town of Grass Range's wastewater treatment plant serves fewer than 100 households in a rural community. The population that would be affected by an increase in wastewater fees to fund pollution control projects constitutes the population of the community and its businesses. As shown in a prior analysis, the costs associated with meeting the applicable numeric nutrient criteria may result in substantial adverse impacts to the community, due to the costs and baseline economic situation in the community.

The baseline economic status of this community also provides some insight into whether the impacts of pollution control expenditures would be widespread in addition to being substantial. Based on several economic indicators, the community shows signs of being economically disadvantaged. It has a declining population and a relatively high share of older residents. Based on 5-year ACS data released between 2010 and 2014, it has a lower MHI, higher unemployment, and higher poverty rates compared with state and national rates.

Local expenditures on pollution control projects will yield some local benefits. First, the project would protect local water quality. Additionally, municipal investments in infrastructure can lead to increased economic activity. The costs associated with installing and operating new treatment systems increase demand for goods and services, which in turn increases the demand for inputs. In addition, the revenues and incomes received by local businesses and workers can increase the demand for other local goods and services, further increasing economic activities. On the other hand, increased household expenditures on wastewater fees reduce households' disposable income. The net economic effect is uncertain.

As determined in the substantial impact analysis, additional pollution controls would increase the town's annual wastewater treatment costs, from $11,376 currently to $73,089 (including annualized capital and recurring O&M costs). Annual household wastewater costs would increase from $144 to $925, an increase of approximately $65 per month. Local businesses may also face increased wastewater fees. These increased rates would be borne across the entire community, with every connected household and business bearing increases in wastewater expenditures. If increased wastewater fees deter potential investments in the area, employment rates, household incomes, property values, and disposable income could decrease while poverty rates and unemployment increase.

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United States Census Bureau. 2013a. American Community Survey (ACS) Table DP03: Selected Economic Characteristics. 2009-2013 5-Year Estimates.

United States Census Bureau. 2013b. American Community Survey (ACS) Table DP05: Demographic and Housing Estimates. 2009-2013 5-Year Estimates.

United States Census Bureau. 2012a. American Community Survey (ACS) Table DP03: Selected Economic Characteristics. 2008-2012 5-Year Estimates.

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United States Census Bureau. 2011b. American Community Survey (ACS) Table DP05: Demographic and Housing Estimates. 2007-2011 5-Year Estimates.

United States Census Bureau. 2010a. American Community Survey (ACS) Table DP03: Selected Economic Characteristics. 2006-2010 5-Year Estimates.

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6. Appendix A: Montana Widespread Impact Test

6.1 Descriptive Questions[7]

1. Geographic Area: Define the affected study area or community. This is the geographic area where direct project costs pass through to the local economy. In the case of municipal pollution control projects, the affected community is usually the immediate municipality. There are, however, exceptions where the affected community includes individuals and areas outside the immediate community. For example, if business activity of the region is concentrated in the immediate community, then outlying communities dependent upon the immediate municipality for employment, goods, and services should also be included in the Widespread analysis. Thus, the Widespread geographical area can encompass a greater area than the immediate town and/or those served by the wastewater system. It can encompass a greater area than defined in Substantial impacts.[8]

2. General Economic Trend: Describe the current general economic trend in the study area or community--qualitatively or quantitatively.

3. Industry Status and Trends: Name the main industry(s) in the study area and indicate if any major industries are intending to enter the area or leave the area. What is the current health of the main industry or of each significant industry if there is more than one? Is the boom and bust potential for the study area great?

4. Population Trend: Indicate the general population trend in the area. Is the community growing or shrinking? If the information is available, you may consider additional population trends such as whether young people are staying in the area or leaving after they graduate school.

6.2 Criteria Questions

5. General Economic Impacts: Describe how the economy in general would be affected, if at all, by having to meet the new water quality standard. Items of discussion could include any loss in population, changes in median income, the closing (or moving to another area) of one or more businesses and industries, or the impact on community and/or commercial development potential in the study area. One can use the baseline data from the Substantial tests to support this answer as well as the answers to the

[7] Helpful resources:
- Local chamber of commerce.
- Montana Dept of Commerce's Certified Regional Development Corporations (CRDC) program. All the counties except Flathead and Richland participate in the program. For information. go to http://businessresources.mt.gov/CRDC.
- The Small Business Development Center (SBDC) can be found at http://sbdc.mt.gov/.
- The American Community Survey is conducted annually and provides long form data on an annual basis for states, counties, incorporated cities and towns, census designated places (CDPs), census tracts and block groups. For more information about the ACS, go to https://www.census.gov/programs-surveys/acs/.
- The number of businesses by industry, the number of employees and an estimated payroll is available through the County Business Patterns of the US Census Bureau available at http://www.census.gov/programs-surveys/cbp.html.
- The Montana Dept of Commerce/Census and Economic Information Center, (406) 841-2740.
- Employment by sector data is available at the state and county level, not for communities. The Montana Department of Labor and Industry publishes this data.

[8] Here are some examples. If business activity in the region is concentrated in a nearby community and not in the immediate community, then the nearby community may also be affected by loss of income in the immediate community and should be included in the analysis. Similarly, if a large number of workers commute to an industrial facility that is significantly affected by the costs, then the affected community should include the home communities of commuters as well as the immediate community.

Descriptive questions above.

6. Employment Impacts: Will meeting the nutrient standards lead to a loss of employment due to a reduction in business activity or closure? Please give specific examples of what might happen?

7. Development Impacts: Will meeting new water quality standards have a substantial effect on residential and commercial development patterns? For example, would homes and businesses choose to locate in different areas or outside of town as a result of higher wastewater fees? In this answer, one may explore historical development patterns, financial and/or tax revenue impacts, population growth impacts, unintended impacts on water quality and any other potential consequences (good or bad).

8. Disposable Income Impacts: What would be the estimated impact, if any, on disposable income of having to meet standards? If the information is available, the applicant may describe how this change in disposable income would affect the overall economy in the area under consideration.

9. Poverty Level Impacts: What is the current poverty level in the affected area and what challenges to this value will occur as a result of the cost of compliance with water quality standards?

10. Multiplier Effects: Are there any multiplier effects from cost or benefits as a result of having to meet the new water quality standard? In other words will a dollar lost or gained as a result of the criteria result in the loss or gain of more than one dollar in the study area (e.g. direct and indirect spending)?

11. Net Debt Impacts: What would be the estimated change in overall net debt of the municipality as a result of having to meet numeric nutrient standards? Would towns closely approach or exceed their debt limits as a result of meeting water quality standards?

12. Water Quality Impacts: Would improved water quality as a result of meeting water quality standards have any widespread positive economic and/or ecological effects on the community? Would expenditures on pollution controls to reach attainment have any positive effects on the community? See the 'Benefits of Water Quality' tab for more details.

13. Additional Impacts: Is there any additional information that suggests that there are unique conditions in the affected community that should also be considered?

6.3 Summary and Conclusions

Please summarize why you believe that the costs of compliance with water quality standards creates a widespread and adverse economic impact in your community that would override the need for increased pollution control.

The main question to ask is whether widespread economic impacts are likely to occur in the study area as a result of attempting to comply with new water quality standards. The key aspect of a "widespread determination" is that it evaluates change in any socioeconomic conditions that would occur as a result of compliance (EPA 1995).

The analyst should take into account as many of the factors listed above as possible when making a decision on whether impacts are widespread. The decision should be made based on all appropriate factors in an objective manner (rather than as a checklist). The analyst will use his or her judgement on whether all the factors taken together (including some that may not be on this list) constitute widespread

impact. Likewise, applicants should not view this guidance as a check list. In all cases, socioeconomic impacts should not be evaluated incrementally; rather, their cumulative effect on the community should be assessed as a whole. Applicants should feel free to use anecdotal information to describe any current community characteristics or anticipated impacts that are not listed in the worksheet.